



CAIT

Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

QUARTERLY PROGRESS REPORT

Project Title:	Investigation into Modified Asphalt Binders for Improved Pavement Performance		
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel		
TASK ORDER NUMBER/Study Number: Task Order No. 80 / 4-23908	PRINCIPAL INVESTIGATOR: Dr. Ali Maher		
Study Start Date: 02/01/2000 Study End Date: 01/31/2003	Period Covered: 3rd Quarter 2002		

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	10%	50%	100%	10%
1. Material Collection	5%	25%	100%	5%
2. Laboratory Testing	50%	20%	80%	40%
3. Calibration	15%	25%	50%	7.5%
4. Reporting	20%	25%	25%	5%
Final Report				
TOTAL	100%			67.5%

1. Progress this quarter by task:

- A. The remainder of duplicate samples was completed for both the Frequency Sweep and Repeated Shear at Constant Height. Results of the Frequency Sweep rank the tested materials in the following order: 1) Koch Materials PG76-22, 2) Citgo PG76-22, 3) Creanova Vestoplast additive, 4) Eastman EE2 additive, 5) Hydrocarbon Technologies Carbon Black additive, and 6) Citgo PG64-22. The ranking was based on the dynamic shear modulus at high, medium, and slow loading speeds. The Koch 76-22 and Citgo 76-22 actually tied based on these results, however, the Koch 76-22 obtained higher dynamic shear modulus values at the slower loading speeds at all temperatures. This was found to be an added benefit and therefore made the Koch 76-22 rank higher. The materials were also ranked based on the recoverable dynamic shear modulus and were identical to the previous ranking, except that the Citgo PG64-22 ranked 5th and the Hydrocarbon Technologies Carbon Black additive ranked 6th.
- B. The ranking for the Repeated Shear at Constant Height test results were evaluated at both 52 and 64 degrees C. The ranking was based on the accumulated permanent shear strain at both 3,000 and 5,000 cycles. Obviously, the samples that developed the least amount of permanent shear strain ranked the best. The ranking for the Repeated Shear at Constant Height were as follows: 1) Koch Materials PG76-22, 2) Citgo PG76-22, 3) Creanova Vestoplast additive, 4) Eastman EE2 additive, 5) Citgo PG64-22, and 6) Hydrocarbon Technologies Carbon Black additive. Based on the Repeated Shear data, the Eastman EE2 material does not seem to be as temperature sensitive as the other materials since it obtained very similar permanent shear strains for the 52 and 64 degree C test temperatures.
- C. Attempts were made to conduct Simple Shear at Constant Height tests at 4 degree C, to accompany the other test temperatures, however, due to unusually hot weather, the environmental chamber had difficulties stabilizing temperatures below 10 degrees C. Therefore, the Simple Shear tests and the Creep Compliance testing was postponed until the weather cooled. If problems persist, the 4 degree C test temperature will not be included in the test. The cooling problem should not occur for the Creep Compliance test since the SST chamber is "piggy-backing" off of the IDT chamber. The IDT chamber is where the Creep Compliance testing will be conducted.

Department of Civil and Environmental Engineering
623 Bowser Rd. Piscataway NJ 08854-8014
Tel : 732-445-0579 Fax: 732-445-0577

CAIT Confidential

Modified-binder-QR-9-1-2002-FINAL.doc

Page 1 of 2



CAIT

Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

2. Proposed activities for next quarter by task:

- A. The SST will be used in the Simple Shear at Constant Height (SSCH) mode. This test is an evaluation of the creep performance of the material at different temperatures. Tests will be conducted at the same temperatures (20, 40, and 52°C) as were the FSCH and RSCH tests, as well as the 4 degrees C.
- B. Creep compliance testing will also be conducted using the IDT system. The creep testing will be tested at (-10, 2, and 20°C). These temperatures were modified from the original set of -10, 0, and 10 degrees C so a better comparison of creep properties can be made to the Simple Shear at Constant Height test. Currently, new test fixtures are being built at James Cox and Sons, Inc. for the creep compliance testing. These fixtures were recommended by a research engineer from NCAT. Therefore, the amount of creep testing will be indicative of when the fixtures come for the manufacturer.

3. List of deliverables provided in this quarter by task (product date)

N.A.

4. Progress on Implementation and Training Activities

N.A.

5. Problems/Proposed Solutions

N.A.

6. Budget Summary*

Total Project Budget(# of years)	3 Years	\$213,544.00
Total Project Expenditure to date		\$181,717
% of Total Project Budget Expended		85%
Task Order Number/Study Number:		80 / 4-23908
Current Task Order Budget (# of years)	Years 1, 2, and 3	\$213,544.00
Actual Expenditure to date against current task order		\$181,717
% of current task order budget expended		85%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

Department of Civil and Environmental Engineering
623 Bowser Rd. Piscataway NJ 08854-8014
Tel : 732-445-0579 Fax: 732-445-0577

CAIT Confidential

Modified-binder-QR-9-1-2002-FINAL.doc

Page 2 of 2